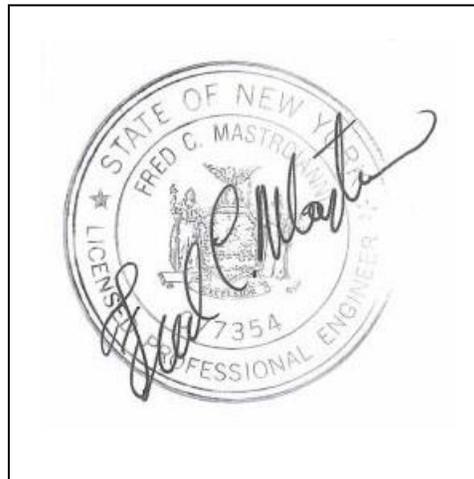


Engineer's Report on Sartoli Avenue Water District Extension Town of Rotterdam, New York



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1.0 INTRODUCTION

The purpose of this Map, Plan, & Report is to present data and information relative to the proposed water district extension for the area of Sartoli Avenue located in the Town of Rotterdam, Schenectady County, New York. This district and water service extension would provide municipal water to properties along Sartoli Avenue.

The project proposes to update the existing stormwater collection systems along Sartoli Ave and Kings Road. The existing roadway on Sartoli Avenue will be reconstructed to provide positive drainage to the existing outlet. The roadway reconstruction allows the opportunity to construct a new 6" water main to provide clean water to the residents that currently experience poor water quality from their exiting groundwater wells. Should the Town choose not to proceed with the design and development of a water system at this time, the capital costs of doing so in the future would increase significantly.

Included in this Map, Plan, & Report are the following:

- Description of the existing water supply distribution systems within the Town of Rotterdam;
- Description and mapping of the proposed water district extension;
- Estimation of the proposed water demand;
- Description of the water supply distribution systems required to service the proposed project;
- Opinion of probable cost.

Criteria outlined in the Great Lakes Upper Mississippi River Board of State Public Health and Environmental Managers (10 State Standards), "Recommended Standards for Water Works", 2014 Edition have been considered in the development of this report.

2.0 PROJECT PLANNING AREA

2.1 Project Location

The project site is located along Kings Road, Sartoli Avenue and Martinalla Avenue (paper street, parallel and south of Sartoli Avenue) in the Town of Rotterdam. The area includes the existing roadways and adjacent residential properties. See the attached Site Location Map in **Appendix A**.

2.2 Environmental Resources

Soils

The on-site soils are exclusively Colonie loamy fine sand. Colonie soil types have a depth to bedrock of greater than 6 feet and groundwater is generally several feet below the surface.

This information was taken from the Soil Survey of Montgomery and Schenectady County, New York, published by the United States Department of Agriculture.

Wetlands and Watercourses

Wetland disturbance is required for the construction of the detention pond and overflow at the terminus of the stormwater upgrades. This disturbance will be less than 0.1 acres which will not require a permit from Army Corps of Engineers. This project location contains a Class B(T) stream but the project will not impact fish or aquatic species. This project is located in a wooded/suburban environment and resident and transient wildlife may occasionally be present in the area. See the attached Wetlands and Disturbance Map in **Appendix B**.

Floodplains

The Flood Insurance Rate Maps for Schenectady County were reviewed. This project is located within map number 36093C0170D. The Federal Emergency Management Agency (FEMA) mapping indicates that the project area is located within a Zone X Area – an area determined to be outside a 500-year flood. No further action is required.

Cultural Resources

A screening of the project area was conducted, which included the review of available information on the New York State Office of Parks, Recreation and Historic Preservation (NYSOPRHP) website to determine if the project area is located in an archeologically sensitive area or near or within National Register sites. The initial review determined that there are no National Register of Historic Places within the project area and is not within an archeologically sensitive area. The project was submitted for review to the State Historic Preservation Office and a letter of no potential impacts was issued. The cultural resources documentation can be found in **Appendix C**.

Threatened and Endangered Species

Endangered Species (Federal) – The United States Fish and Wildlife Service IPAC system was accessed on January 1, 2020 to determine if there are federally listed threatened and/or endangered species that may reside within or adjacent to the project area. The IPAC system indicates that the following federally listed species may exist in or near (within ½ mile) the project area:

- Northern Long-eared Bat (*Myotis septentrionalis*) – Threatened
- Karner Blue Butterfly (*Lycaeides melissa samuelis*) - Endangered

The Northern Long-eared Bat typically hibernates in caves in the winter and roosts and breeds in tree crevices during the spring, summer and fall. The project proposes to cut trees during the winter months to avoid any potential bat roosting habitats.

The Karner Blue Butterfly is an endangered species that is found only within the globally-rare pine bush ecosystem. They subsist on wild blue lupine and reside in open woods and clearings, typically associated with pitch pine and/or scrub oak. The project location includes land designated as part of the Schenectady Pine Barren Preserve and appears to have been recently restored to promote natural pine bush conditions. The project location is not listed as a critical habitat for Karner Blue Butterfly. The project site was visited by NYSDEC staff and no potential suitable habitat was discovered.

3.0 EXISTING WATER SYSTEM

3.1 Water Supply, Treatment, Storage and Distribution

Per the Town of Rotterdam, 2018 Annual Drinking Water Report; the Town of Rotterdam draws water from the Great Flats Aquifer through drilled wells, to serve two water districts, #3 and #5. The project area is adjacent to Water District #5. Water district #5 has a permitted pumping capacity of 10,000,000 gallons per day with a maximum peak day average of 9,100,000 gallons. The system pumping is capable of delivering 7,000 gallons per minute with elevated storage tanks and standpipe storage capacity of 5.2 million gallons. The transmission mains are 24" in diameter which provide water to 11,000 service connections which serve approximately 25,000 people. In 2018 Water District #5 distributed 1,479,827,000 gallons of water. The estimated average daily demand was 4,049,222 gallons and the single highest day was 8,505,000 gallons. Water District #5 has an emergency interconnect with the City of Schenectady. The annual unmetered water consumption charge is \$75 per household for residential and commercial uses. During 2018 the system did not experience any restrictions to their water source and therefore is capable of providing the site with adequate water. The Annual Drinking Water Quality Report for 2018 can be found in **Appendix D**.

After issuing a draft version of a drainage report related to the project, a public meeting was held on July 12, 2018 at 7 pm to discuss the findings with the neighboring residents of the project area. Comments and concerns from the neighboring residents were collected and incorporated into the final version of the drainage analysis, with a few key issues summarized as follows: Many residents along Sartoli Avenue expressed concerns of the flooding taking multiple days to drain, which would stop mail service and access to properties. Residents along Kings road expressed concerns that runoff backed up out the catch basins during heavy rain events as well, confirming the entire system did not have enough capacity. The residents along Rome Avenue and Sartoli Avenue also expressed concern about the flooding causing their wells to be contaminated and that most of them can only drink bottled water. Please see **Appendix E** for the public hearing attendance sheet.

3.2 Water Pressure

Per guidance from the Town of Rotterdam Department of Public Works (the Project Sponsor), it is expected that the existing water main along Kings Highway provides adequate volume and pressure to serve the domestic water demand in this area.

3.3 Existing Water Service

The five (5) of the existing parcels with seven (7) dwelling units, with frontage on Sartoli Avenue (refer to **Appendix F**) are reported to be served by private drinking water wells and do not have access to public drinking water for domestic use. These water wells are reported, by the residents, to yield water that they feel is unfit for consumption due to contamination resulting from the drainage issues and flooding in the surrounding area (as noted at the Public Hearing on July 12, 2018).

4.0 PROPOSED WATER SYSTEM

4.1 Anticipated Water Demand

Design demands for the proposed new water service connections were derived from Table 3 of the NYSDEC Design Standards for Wastewater Treatment Works, 1988 and equating wastewater generation to water demand. Based upon Table 1: “Projected Water Demands” below, the average daily demand newly connected residences is proposed to be 1980 gallons per day (gpd) or 1.4 gallons per minute (gpm). The Town of Rotterdam has ample excess water supply to meet the anticipated project’s demands.

A maximum daily demand factor of 2.0 was used yielding a max day demand of 3,960-gpd or 2.75-gpm. The peak hourly flow is calculated by multiplying the average daily flow by a peaking factor. Based on Figure 1 of the “Recommended Standards for Wastewater Facilities, 2014” a peaking factor of 4.0 is suitable for this project given the projected population of ±20 persons. Based on the peaking factor of 4.0, the peak hourly flow is projected to be 5.5-gpm.

Table 1: Projected Water and Sewer Use

Address	Tax Map No.	Use	EDU (Equivalent Dwelling Units)	Unit (Bedroom)	Unit Rate (gpd/unit)	Average Daily Demand (gpd)
1 Sartoli Ave.	60.17-2-1.1	Dwelling	1	2	110	220
2 Sartoli Ave.	60.17-1-10	Dwelling	1	3	110	330
3 Sartoli Ave.	60.17-2-8	Dwelling	1	3	110	330
4 Sartoli Ave.	60.17-1-8.1	Dwelling	1	3	110	330
6 Sartoli Ave.	60.17-1-8.1	Dwelling	1	3	110	330
8 Sartoli Ave.	60.17-1-6.1	Dwelling	1	2	110	220
10 Sartoli Ave.	60.17-1-6.1	Dwelling	1	2	110	220
Total:						1980
Max Day Peaking Factor:						2.0
Max Daily Flow (gpd):						3960
Max Daily Flow (gpm):						2.75
Hourly peaking Factor:						4
Peak Hourly Flow (gpm):						5.5

Table 1 Notes:

1. Hydraulic Loading Rates from Table 3 of the NYSDEC Design Standards for Intermediate Sized Wastewater Treatment Systems 2014 unless otherwise noted below.
2. Projected water demand assumes full occupancy of dwellings.

4.2 Proposed Water System Modifications

The Project Sponsor is proposing an extension to Water District #5, water system upgrades and the connection of five (5) residential parcels with seven (7) dwelling units, as a component of a larger drainage and roadway infrastructure improvement project. The Town of Rotterdam Water District #5 will be extended to include the five (5) residential parcels along Sartoli Avenue as show in the Water District Extension Map in **Appendix G**. The project proposes to construct ±530 LF of 6” plastic water main with two (2) fire hydrants, one intermediate and one end of line and to provide seven (7) service connections to the dwelling units with frontage along Sartoli Avenue. In addition, the project will add a new fire hydrant on Rome Avenue within the Town Right-of-Way. See proposed water services map in **Appendix F**.

Based upon information obtained from the Town of Rotterdam Department of Public Works it is anticipated that there is adequate hydraulic volume and pressure to meet the domestic water demands of these residences.

5.0 PROJECT COST ANNUAL USER COST ANALYSIS

5.1 Opinion of probable costs

Based on the collection system design discussed above, capital cost estimates have been prepared for the project inclusive of the construction of the water distribution system. Major roadway improvements have been accounted for in the planned Town of Rotterdam Drainage Improvement work, only pavement restoration from trenching is included in these estimates. Costs are provided in more detail in attached **Appendix H** but have been estimated to be approximately \$100,000. Water costs include the new 6" water main, service laterals and curb stops up to the property line and new hydrants.

5.2 Annual User Cost Analysis

The proposed costs to the typical user are based on three elements: a share of debt service, operation and maintenance of the District and water consumption fee. As required by Article 12 of New York State Town Law, these costs will be charged on a benefit basis.

5.3 Capital Debt Retirement

The construction of the proposed water distribution system as outlined in this Map, Plan, and Report is seeking State/Federal grant funding or Schenectady County funds for \$90,000 of the proposed work. Issuance of bond anticipation notes to finance the remaining project cost of \$10,000. The Town plans to bond the proposed project for 30 years at an estimated 3.5%¹ interest rate. The resulting annual debt payment (including both principle and interest) is approximately \$538.80 for costs not covered after funding assistance. In accordance with current Town policy, debt service will be paid by the owners of all existing properties in the area of the proposed District extension. In the event that these vacant properties are developed, they will be reallocated debt service Equivalent Dwelling Units (EDUs) based on water usage (but will not be allocated less than 1 EDU). There currently exist 7 EDUs in the proposed District for the purposes of debt retirement. Dividing the annual debt retirement cost by the number of debt service EDUs results in an annual debt service charge of approximately \$76.97/EDU.

A list of all the properties in the proposed District and their assigned EDUs is provided in Table 1.

5.4 Operation and Maintenance Costs

Users within Water District #5 will be responsible for costs related to the operation and maintenance (O&M) of the treatment and distribution system. Annual operation and maintenance costs for the

¹ Average market interest rate used for calculation purposes. Actual rate may vary based on the bond acquired.

proposed collection system have been estimated in Table 2 below based on the 2019 rate of 0.344785 per \$1,000 of assessed parcel value. Operation and maintenance costs associated with the connection of these 7 dwelling units to be satisfied by the annual operation and maintenance fee as is typical throughout the district.

Table 2: Operation and Maintenance Cost

Address	Parcel #	Assessed value	O & M Cost
1 Sartoli Ave.	60.17-2-1.1	\$76,000	\$26.20
2 Sartoli Ave.	60.17-1-10	\$133,000	\$45.86
3 Sartoli Ave	60.17-2-8	\$200,000	\$68.96
4 Sartoli Ave.	60.17-1-8.1	\$105,000*	\$36.20
6 Sartoli Ave.	60.17-1-8.1	\$105,000*	\$36.20
8 Sartoli Ave.	60.17-1-6.1	\$100,000*	\$34.48
10 Sartoli Ave.	60.17-1-6.1	\$100,000*	\$34.48
Median Cost			\$47.58

Table 2 Notes:

* The assessed values for parcels 60.17-1-8.1 is \$210,00 and 60.17-1-6.1 is 200,000. The values were divided by 2 since they are duplexes and to equate them to the equivalent dwelling units.

5.5 Water Consumption Fee

Water usage in Water District #5 is not metered. Residents are charged a nominal flat rate for consumption. The current annual water consumption rate for the Town of Rotterdam Water District #5 is \$75.00 per household for residential and commercial.

5.6 Annual User Cost Summary

As discussed above the annual user cost for Water District #5 is determined by capital debt retirement, operation and maintenance costs and consumption fee of the treatment and distribution systems. The annual capital for each EDU is \$76.97, the breakdown can be found in Section 5.3 of this report. The median operation and maintenance cost of \$47.58 was used to determine the annual user cost, parcel specific O&M costs can be found in Table 2 of this report. For a single-family residence or multi-unit building, with average water usage rates of 75,000 gallons per year per dwelling unit, the approximate

annual user charges are as follows:

Debt Service Cost	\$76.97
Operation and Maintenance	\$47.58
Consumption Fee	\$75.00
Annual User Cost	\$199.55

Additionally, property owners are responsible for the costs of connecting from the building to the water shutoff valve at the edge of the Town, County, or State roadway right-of-way. As of 2015, the Town charges a one-time \$35 Water Service Permit fee as well as Water Service Tap fees of \$1,100 + \$4.00/ft. of water service if on same side of the street, and \$1,500 + \$4.00/ft. of water service if on opposite side of the street. The Town Board may consider waiving this connection fee in order to encourage connections, and to help alleviate the costs of connection pending review of funding options.

6.0 OWNERSHIP OF PROPOSED INFRASTRUCTURE

The Town of Rotterdam will oversee the construction of and accept the completed infrastructure, assuring that the proposed water system is built to their standards, and proper easements are provided and executed.

7.0 EASEMENTS AND RIGHT-OF-WAYS

It is not anticipated that any easements will be required for the construction of the project nor that any modification to existing or creation of new rights-of-way will be required.

8.0 FUTURE ACTIONS FOR PROJECT PERMITTING AND APPROVAL

The following permits and/or approvals are required prior to construction of the Project:

- Submission of this Map, Plan, and Report to the Town Board, followed by a Public Hearing and potential revisions to this Map, Plan, and Report based upon public hearing comments.
- Final review and acceptance of this Map, Plan and Report by the Town Board.
- New York State (NYS) Department of Health Approval
 - Plan Approval

- DOH348 Approval (extension of Water District by Town of Rotterdam)
- NYS Department of Environmental Conservation (NYSDEC)
 - Stormwater Pollution Prevention Plan.
 - Article 24 Freshwater Wetlands Permit
 - Water Withdrawal Permit
- Review and Approval by Army Corps of Engineers Nationwide Permit for wetland impacts
- Construction drawings and specifications for construction prepared by the Engineer.
- Review and approval of drawings and specifications by the City of Schenectady.
- Bonding for required project costs.
- Approval of a Highway Work Permit for work on Town roads – Town of Rotterdam Highway Department.
- Approval of a Highway Work Permit and Utility Permit for work on County roads – Schenectady County Engineering and Public Works.

9.0 CONCLUSIONS AND RECOMMENDATIONS

GPI has completed the investigation and analysis of water supply for the proposed Water District Extension and new water main and services along Sartoli Avenue.

Based upon the proposed development, a projected average day water demand of 1,980-gpd or 1.38-gpm is expected. Given the appropriate peaking factors of 2.0 and 4.0, the projected max day and peak hourly demand is 3,960-gpd and 5.5-gpm respectively.

Water service along Sartoli Avenue will be provided by the Town of Rotterdam Water District #5. There were no restrictions on the water system in 2018 so the existing water distribution system should have the capacity to meet the proposed demand. The parcels which are proposed to be served, are not currently located within Water District #5 and as such a Water District Extension will be required.

The annual user cost for the project was determined to be \$199.55/EDU.

Following consideration of the lack of public water services, the potential contamination of the existing wells, the relatively low cost of the project and the adequacy of the existing infrastructure to serve the need; it is recommended that the Town of Rotterdam Water District #5, extend the district to these unserved parcels.

APPENDIX A
Project Location Map

APPENDIX B
Wetland and Limits of Disturbance Map

APPENDIX C
Cultural Resources Documentation

APPENDIX D
Annual Drinking Water Quality Report 2018

APPENDIX E
Public Hearing Attendance Sheet

APPENDIX F
Existing and Proposed Water System

APPENDIX G
Water District Extension Map

APPENDIX H
Opinion of Probable Cost

GPI

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